SLF ok 9/30/93

Report No.: 8003-08-0
Work Assignment No.: 019-2JZZ
Contract No.: 68-W9-0051
September 15, 1992
Updated: December 8, 1992

Sandra Foose
U.S. Environmental Protection Agency (USEPA)
Region II
Edison, New Jersey 08837

RE: Flags, Inc. Site Inspection Prioritization Letter Report

Dear Ms. Foose:

This correspondence provides a description of the Flags, Inc. (a.k.a Amko Manufacturing, Inc.) site (U.S. Environmental Protection Agency (USEPA) I.D. No. NJD002352300) located at 41 Oak Ave., in Bellmawr, Camden County, New Jersey.

Flags, Inc. is an active facility located on approximately two acres of land in a mixed commercial/residential area. During the period between 1945 to 1985 Flags, Inc. manufactured metal surgical instruments. As part of this process, a vapor degreaser was used for cleaning and drying metal parts. In addition, trichloroethylene and the acids (nitric, sulfuric, and muriatic) were used for pickling and cleaning of metal parts. For a period of 40 years, Flags, Inc. had been disposing of between one quart and one gallon per year of semi-liquid residue from their degreasing operations onto the ground surface outside the facility. This residue consisted of fibers from the polishing wheels, polish, and oils. The site documentation indicates inspections conducted by the New Jersey Department of Environmental Protection and Energy (NJDEPE) between 1983 and 1986 during which violations noted included the improper disposal of waste, and the unpermitted discharge of non-contact cooling water into an unlined drainage ditch, located along the southern perimeter of the site, without a New Jersey Discharge Elimination System (NJPDES) permit. Flags, Inc. was notified of the violations, and ordered to immediately correct them. By 1984, the residue was no longer being disposed of onto the ground. Instead, the residue was placed in a well-ventilated room, allowed to dry, and disposed of with the facility's non-hazardous solid waste. The unpermitted discharge of non-contact cooling water was discontinued by 1985.

In 1985, six soil samples were collected in compliance with the Environmental Cleanup Responsibility Act (ECRA) guidelines from the former disposal area, and from the unlined ditch which received non-contact cooling water. All samples were analyzed for volatile organic compounds, and only tetrachloroethylene was detected. As a result of this sampling, approximately 1.5 cubic yards of soil was excavated from the former disposal area. The area was backfilled with clean sand, and the soil removed off-site to an approved waste facility. Subsequently, NJDEPE approved a Negative Declaration calling for no further remedial action at the Flags, Inc. facility on July 10, 1985.

An EPA site inspection report was completed for the Flags, Inc. Site in 1991. Ten on-site soil samples were collected during the site inspection from the southern and western portions of the property at depths ranging from zero to seventy-two inches. All samples were analyzed and validated through the USEPA Contract Laboratory Program (CLP), and sample analysis indicated the presence of inorganic constituents. A reference soil sample from an area free of influence by past activities was not collected.

The screening score for the Flags, Inc. site is 11.84. A defined area of suspected soil contamination was indicated as the waste source for the Flags, Inc. site. This area was defined through soil sampling that indicated the presence of several inorganic contaminants in on-site soils.

The score for the groundwater migration pathway is 19.88. The Flags, Inc. site overlies four geologic units

that consist of (in descending order of depth) the Englishtown Formation, the Woodbury Clay, the Merchantville Formation, and the Potamac-Raritan-Magothy (PRM) aquifer. The site is situated over the outcrop area of the Englishtown Formation. This unit consists of a massive dark-colored silty sand that is approximately forty feet thick. It reportedly contains a west to east groundwater flow at a depth of approximately 30 feet. Underlying the Englishtown Formation is the Woodbury Clay. This strata is composed of grayish-black massive micaceous clayey silt, and is approximately one hundred feet thick. The next lowest unit is the Merchantville Formation which is composed of dark gray to grayish-black micaceous clay to clayey silt with beds and lenses of glauconite sand which become more prominent near the top of the formation. The thickness of this unit is approximately fifty feet. Together, the Merchantville Formation and the Woodbury Clay act as a confining unit, however the lensing sand at the top of the Merchantville Formation may be tapped for potable water near the outcrop area. Underlying the Merchantville Formation is the PRM aquifer system, the most productive system in Camden county. This aquifer consists of sand with some gravel and is separated into three hydrogeologic units; the upper, the middle, and the lower, by confining units consisting of silts and clays. The total thickness for this system is approximately 400 feet.

Within four miles of the site, groundwater is used extensively as a source of drinking water. Thirty-nine public supply wells from various water departments have been identified within a 4-mile radius of the Flags, Inc. site. Documentation indicates that thirty-seven of the wells draw from the lower PRM aquifer, and two of the wells tap the middle PRM aquifer. However, the presence of the abovementioned confining layers overlying these aquifers result in a low potential for contaminant migration to these municipal supply wells. The nearest well (screened in the lower PRM aquifer) is owned by the New Jersey American Water Company and is located approximately 0.57 miles north of the site. The total service population within four miles of the site is 123,227 people (0 - 0.25 mile, 0 people; 0.25 - 0.50 mile, 0 people; 0.50 - 1 mile, 14,317 people; 1 - 2 mile, 42,985 people; 2 - 3 mile, 39,410 people; 3 - 4 mile, 26,515 people). The proximity of the site to a wellhead protection area cannot be determined, pending promulgation by the NJDEPE of protected areas.

The score for the surface water pathway is 0.21. Stormwater and potential site-derived liquid material if spilled, would drain by overland flow to the Little Timber Creek which is located approximately 1,100 feet north of the site. The Little Timber Creek flows west to a confluence with the Delaware River which supports a bass population, and a New Jersey state endangered species. National Wetland Inventory (NWI) Maps and the U.S.G.S. Topographic Quadrangle for the surface water pathway indicate the presence of one-tenth of a mile of wetland frontage along Little Timber Creek, and sixteen miles of wetland frontage along the Delaware River. These wetlands consist of riverine tidal flats. The drinking water threat is of low potential concern as no surface water intakes are located within the target distance limit.

The score for the soil exposure pathway is 12.86. Although inorganic contaminants have been detected in surficial (0-2 feet) soil samples, there are no schools or day care facilities within 200 feet of the site. In addition, no documentation exists indicating the presence of contamination on nearby residential properties. The site is active with approximately three on-site workers. No known terrestrial sensitive environments are located on areas of suspected soil contamination.

The score for the air migration pathway is 0.48. Available documentation does not indicate a release to air from the site. Additionally, the only remaining waste source on-site is contaminated soil containing inorganic constituents with low air mobilities. Two acres of wetlands have been identified within a 1/2 mile radius of the Flags, Inc. site. Finally, there are approximately 197,936 people living within four miles of the site. This information does not support a significant air component score.

In summary, the lack of a significant waste source, combined with the characteristics of the underlying geology of the site, result in an overall score of 11.84. Therefore, the recommendation given for the above facility, based on background information gathered, is **SITE EVALUATION ACCOMPLISHED (SEA)**. The following is the definition of SEA: To the best of the EPA's knowledge, Superfund has completed an assessment at this site, and has determined that no further steps to list this site on the NPL will be taken unless information indicating that this decision was not appropriate or other considerations make a recommendation for listing appropriate at a later time. A "SEA" decision does not necessarily mean that there is no hazard associated with a given site; it means only that based upon available information, the location is not judged to be a potential NPL site.

If you have any questions concerning the above, do not hesitate to call me at (609)-860-0100.

Sincerely,

LISA SZEGEDI
SITE MANAGER

JOHN D. RIECKHOFF
PRE-REMEDIAL PROGRAM MANAGER

DENNIS STAINKEN, Ph.D.
WORK ASSIGNMENT MANAGER

MALCOLM PIRNIE, INC. **PROJECT NOTES**

To: File **Date:** August 10, 1992

From: Lisa Szegedi **Project #:** 8003-080

Subject: Drinking Water Sources **Site Name:** Flags, Inc.

Within 4 miles of the site there are the following towns with the following sources of drinking water.

1) **Bellmawr Twp.**-Bellmawr Twp. obtains their drinking water from 4 wells which all pump at approximately the same level. 2 of the wells are located in the 1/2-1 mile ring while 2 of the wells are located in the 1-2 mile ring. The total service population is 9,522 people. Both wells located in the 1/2-1 mile ring tap the lower P-R-M aquifer while both of the wells located in the 1-2 mile ring tap the middle P-R-M aquifer. Therefore, 1/2-1 mile ring Lower aquifer 4,761 people served

1-2 mile ring Middle aquifer 4,761 people served

2) **Brooklawn Twp.**-Brooklawn Twp. obtains their drinking water from 3 wells which all pump at approximately the same level. All 3 of the well are located in the 2-3 mile ring and the total service population is 2,520 people. All of the wells tap the lower P-R-M aquifer.

3) **Westville Twp.**-Westville Twp. obtains their drinking water from 3 wells which all pump at approximately the same level. All 3 of the wells are located in the 2-3 mile ring, and the total service population is 7,000 people. All of the wells tap the lower P-R-M aquifer.

4) **Deptford Twp.**-Deptford Twp. obtains their drinking water from 6 wells which all pump at approximately the same level. Only 1 of the wells is located within 4 miles of the site, and it is located in the 2-3 mile ring. The total service population is 29,000 people. Therefore, 2-3 mile ring, 4,834 people served. Based on well depth it is assumed this well taps the lower P-R-M aquifer.

5) **Collingswood Twp.**-Collingswood Twp. obtains their drinking water from 7 wells which all pump approximately the same level. 2 of the wells are located in the 2-3 mile ring, and 5 wells are located in the 3-4 mile ring. The total service population is 21,000 people. Therefore, 2-3 mile ring, 6,000 people served, and 3-4 mile ring, 15,000 people served. All of the wells tap the lower P-R-M aquifer.

MALCOLM PIRNIE, INC.	PROJECT NOTES

To: File	**Date:** August 10, 1992
From: Lisa Szegedi	**Project #:** 8003-080
Subject: Drinking Water Sources	**Site Name:** Flags, Inc.

(con't)

6) **Haddonfield Twp.**-Haddonfield Twp. obtains their drinking water from 4 wells which all pump at a approximately the same level. All 4 of the wells are located in the 3-4 mile ring, and the total service population is 11,515 people. All 4 of the wells tap the lower P-R-M aquifer.

7) **Gloucester City**-Gloucester City obtains their drinking water from 2 wells and 2 back-up wells. Both wells in use pump at approximately the same level. All 4 wells (those in constant use and the two back-ups) are located in the 2-3 mile ring and the total service population is 12,400 people. All wells are considered to tap the lower P-R-M aquifer.

8) **Camden**-Camden obtains their drinking water from public supply wells. All of the wells are located outside of 4 miles from the site.

9) **Mt. Ephraim, Haddon Height, Vorhees**-They obtain their drinking water from the N.J. American Water Co. N.J. American Water Co. operates 45 wells which serve approximately 215,000 people. Altogether, 15 of their wells are located within 4 miles of the site, with 2 wells located in the 1/2-1 mile ring, 8 wells located in the 1-2 mile ring, and 5 wells located in the 2-3 mile ring. All of the wells are considered to tap the lower P-R-M aquifer.

215,000/45 = 4,778 people per well.

1/2-1 mile ring	2 X 4,778 = 9,556 people
1-2 mile ring	8 X 4,778 = 38,224 people
2-3 mile ring	5 X 4,778 = 23,890 people

Summary

0-1/4 mile ring	0 people
1/4-1/2 mile ring	0 people
1/2-1 mile ring	4,761 + 9,556 = 14,317 people using lower P-R-M
1-2 mile ring	38,224 people using lower P-R-M
	4,761 people using middle P-R-M

MALCOLM PIRNIE, INC. **PROJECT NOTES**

To: File	**Date:** August 10, 1992
From: Lisa Szegedi	**Project #:** 8003-080
Subject: Drinking Water Sources	**Site Name:** Flags, Inc.

(con't)

2-3 mile ring	2,520 +7,000 + 6,000 + 23,890 = 39,410 using the lower P-R-M
3-4 mile ring	15,000 + 11,515 = 26,515 people using the lower P-R-M

008-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

FUDS

File No. 8003-08-0

Date: 6 AUGUST 1992 Time: 1059 [✓] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: MARK HUFF 609-931-5721
Telephone No.
Affiliation: BELLMAWR WATER DEPT., ASST. SUPERINTENDANT

Malcolm Pirnie Staff: _____
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MR. HUFF LOCATED THE 4 WELLS FOR THE BELLMAWR TWP AS FOLLOWS

- 2 wells - LEAF AVENUE / BELT ALE - 1000 GPM (TREATMENT PLANT)
  #7 = 1000 GPM #5 = 1000 GPM
- 2 wells - WARREN / CARTER AVE
  #8 = 800 GPM #6 = 1000 GPM
- WELLS DRAWING FROM POTOMIC / RARITAN AQUIFER
- CURRENTLY SUPPLYING APPROXIMATELY 9522 PERSONS

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018-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: August 25, 1992 Time: 9:00 AM [] PM []

Outgoing Call

To: Tony Sansone (609)-931-5721 Telephone No.

Affiliation: Bellmawr Water Dept.

Malcolm Pirnie Staff: Lisa Szegedi Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

Both wells located at Leaf Ave./Belt Ave. tap the lower Potomac-Raritan aquifer, while both wells located at Warren Ave./Carter Ave. tap the middle Potomac/Raritan aquifer.

016-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 7 AUGUST 1992 Time: 9:54 [✓] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: BILL PACKER 609-456-7785
Telephone No.
Affiliation: SUPERINTENDANT, WESTVILLE/BROOKLAWN WATER DIST.

Malcolm Pirnie Staff: RICKEY KAMPFER 609-860-0100
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MR PACKER INFORMED ME OF THE FOLLOWING LOCATIONS FOR WELLS IN WESTVILLE / BROOKLAWN

- WESTVILLE
  - #4 - 114 CROWN POINT RD
  - 5 - PINE ST. / CROWN POINT RD.
  - 6 - RIVER DRIVE
- WELLS DRAW FROM POTOMIC-RARITAN-MAGOTHY AND ARE
- 300-350 FEET DEEP, AVG. PUMPAGE 800-1000 GPM
- CURRENTY SUPPLYING APPROX. 7000 WEST PERSONS
- BROOKLAWN
  - 1 BROADWAY/TOWN CENTER
  - 3 TOWN CENTER
  - 4 TIMBER BLVD / NEW LEESEY RD.
- WELLS PUMP 300-400 G.P.M, ARE APPROX 300-350 FEET DEEP DRAWING FROM RARITAN-POTOMIC-MAGOTHY
- CURRENTLY SERVICE 2520 PERSONS

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99-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: August 28, 1992 Time: 9:57 AM [X] PM []

Outgoing Call

To: Bill Packer (609)-456-7785 Telephone No.

Affiliation: Westville/Brooklawn Water District

Malcolm Pirnie Staff: Lisa Szegedi Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

All of the wells in Brooklawn tap the lower P-M-R aquifer. Wells #4 and #6 in Westville also tap the lower P-M-R aquifer. Well #5 in Westville in screened in both the upper and lower P-M-R.

015-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 7 Aug 1992 Time: _____ [ ] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: ED DEAK (609) 848-0200
Telephone No.
Affiliation: SUPERINTENDANT, DEPTFORD TWP WATER DEPT.

Malcolm Pirnie Staff: RICKEY KAMPFER
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

DEPTFORD TWP CURRENTLY OPERATES 6 WELLS, HOWEVER WELL NO 8 WILL BE ON-LINE SHORTLY (NEXT 30 DAYS). THE LOCATIONS ARE AS FOLLOWS

Well #	Location	Pumpage	Depth
2	- PRINCETON / OAK VALLY RD	900 GPM	400 feet
1	- PRINCETON / HAVERFORD AVE	900 GPM	
4	- 3RD AVE / SUMMIT (WESTVILLE GROVE)	850 GPM	
5	- COUNTY HOUSE RD / INDIAN TRAIL AVENUE (GIBBSBORO CITY)	700 GPM	
6	- SOUTH VIEW / DELSEA DRIVE (WOODBURY)	1000 GPM	
7	- BANK BRIDGE BLVD (LAND O LAKES DULPMENT)	1000 GPM	
* 8	- ANDRESSON DRIVE / JARIT DRIVE (IN WOODS)	1000 GPM	

* NO OPERATIONAL AS OF THIS PERIOD

- ALL DRAW FROM RARITAN - POTOMIC - MAGOTHY AQUIFER
- CURRENTLY SERVICE APPROXIMATELY 29000 PERSONS

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020-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: August 28, 1992 Time: 10:08 AM [X] PM [ ]

Outgoing Call

To: Ed Deak (609 -848-0200 Telephone No.

Affiliation: Deptford Twp. Water Dept.

Malcolm Pirnie Staff: Lisa Szegedi Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

Mr. Deak does not know if the wells tap the upper, middle, or lower P-M-R aquifer, however all of the wells are drilled to a depth of approximately 400 feet, and they screen from 150 to 230 feet.

014-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

FLAGS
File No. 8003-08-0

Date: 7 AUGUST 1992 Time: 8:21 [✓] AM [ ] PM

[ ] Incoming Call From: _____ Telephone No.

Affiliation: _____

[✓] Outgoing Call To: JOHN MYER 854-2332 Telephone No.

Affiliation: SUPERINTENDANT, COLLINGSWOOD

Malcolm Pirnie Staff: RICKEY KAMPFER
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MR MYER LOCATED THE SEVEN WELLS OPERATED BY THE COLLINGS WOOD WATER DEPT.

#1 CATEL ROAD ALONG NEWTON LAKE
#2 " "
3 HILLCREST & MAPLE
4 SOUTH PARK DRIVE AT END (APPROX) OF GARFIELD
5 LOCATED IN ROBERTS PARK
6 " "
7 " "

- WELLS ARE APPROXIMATELY 250-325 FEET DEEP AND DRAW FROM THE POTOMAC-RARITAN-MAGOTHY FORMATION AQUIFER
- WELLS PUMP 600-1000 GPM
- CURRENTLY SUPPLYING APPROX 21,000 PERSONS

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071-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: August 28, 1992 Time: 11:14 AM [X] PM []

Outgoing Call

To: John Myer (609)-854-2332 Telephone No.

Affiliation: Collingswood Water Dept.

Malcolm Pirnie Staff: Lisa Szegedi Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

Mr. Myer does not have any specific information on which aquifer the wells tap (upper, middle, or lower), however in his opinion it is probable that all wells tap the lower P-R-M aquifer.

013-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 7 AUG 1992 Time: 1030 [✓] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[ ] Outgoing Call To: JOE KING PUBLIC WORKS 609-429-4700 EXT #4
Telephone No.
Affiliation: SUPERINTENDANT, HADDONFIELD TWP WATER DEPT

Malcolm Pirnie Staff: RICKEY KAMPFER
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MR KING LOCATED THE 4 WELLS CURRENTLY IN OPERATION

WELL NO	LOCATION	DEPTH	PUMPAGE
2	- RIELYWOOD AVENUE	300	900 GPM
6	- LAKE ST. (NEAR COLONIAL AVE.)		@ 1440 GPM
5	- CENTER ST (FOOT OF WALNUT ST.)		1000 GPM
7	- CENTER ST. (FOOT OF WALNUT ST.)		800 GPM

- ALL WELLS DRAW FROM RARITAN, MAGOTHY - BIOMIC AQUIFER
- CURRENTLY SERVES 11,515 PERSONS

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073-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: September 2, 1992 Time: 1:45 AM ☐ PM ☒

Outgoing Call

To: Maureen Lantier (609)-429-4700 ext. 4 Telephone No.

Affiliation: Haddonfield Twp. Water Dept.

Malcolm Pirnie Staff: Lisa Szegedi Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

All 4 of the wells operated by the Haddonfield Water Dept. tap the lower P-R-M aquifer.

012-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 7 AUGUST 1992 Time: 9:39 ☑ AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[☑ Outgoing Call To: TOM KAIN 609-456-0169
Telephone No.
Affiliation: SUPERVISOR, GLOUCHESTER CITY WATER DEPT.

Malcolm Pirnie Staff: RICKEY KAMPFER 609-860-0100
(Receiving or Calling) Name Telephone No.

Summary of [☑ Conversation [ ] Agreement:

- MR KAIN INFORMED ME OF 4 WELLS LOCATED ON JOHNSON ~~AVE~~ BLVD ADJACENT TO HUDSON ST.
- OF THE 4, ONLY 2 ARE USED, THE OTHER 2 BEING BACK-UPS FOR EMERGENCIES
- WELLS DRAW FROM THE RARITAN-POTOMIC-MAGOTHY AQUIFER
- WELL PUMP AVG 1000 GPM, DEPTH APPROX 200 FEET
- CURRENTLY SERVICE 4,092 ACCOUNTS; APPROX 12,400 PERSONS

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022C

MALCOLM PIRNIE

MEMORANDUM

To: Lisa Szegedi, CNJ **Date:** August 27, 1992

From: Gary C. Martin, P.E., DLV

Re: City of Camden Water Supply

Per our discussion, and subsequent discussion and review for release of information by Mr. Frederick H. Martin, Director of Utilities, City of Camden, I have compiled the information requested by your office. I have extracted the copied information from three sources: Engineering Report Water System Improvements, September, 1981; Study Report City of Camden Water System Improvement Study, Initial Draft, October, 1990; and Preliminary Design Camden Parkside Water Treatment Plant Improvements, October, 1989. Each of these references were prepared by Malcolm Pirnie as part of ongoing City of Camden Water System Efforts. On the attached copies, I have labeled the reports as Report 1, Report 2, and Report 3 respectively by putting a number in the upper left corner of the copies.

I have cleared the attached information through Mr. Martin. Any additional questions should be referred to either myself, or to Dominick Ruggiero in NNJ (Dominick has the originals and will be finalizing the Water System Improvement Study..

I believe your questions were as follows (the answers follow the questions):

- Location of all public water supply wells (either latitude and longitude, or street addresses, or locations on USGS Quad maps).

  The attached maps detail the locations of the Morris, Delair, and Puchack Run wells. The Parkside wells are (for the purposes of your degree of accuracy, adjacent to the Parkside Plant.

- Whether each well is blended or is the sole supply to a particular service area.

  All of the City wells are blended into the City system.

- Service population for the individual or blended service areas.

  The Population served by the City of Camden water system is 50,000 customers.

- Aquifer and/or depth for each well.

  This information is on the attached sheets.

- Pumpage values for each well.

  This information is on the attached sheets.

- Service area for the supply system.

  This information is on the attached sheets.

c: *City of Camden*
Tom Lane
Dominick Ruggiero

FIGURE 1-1

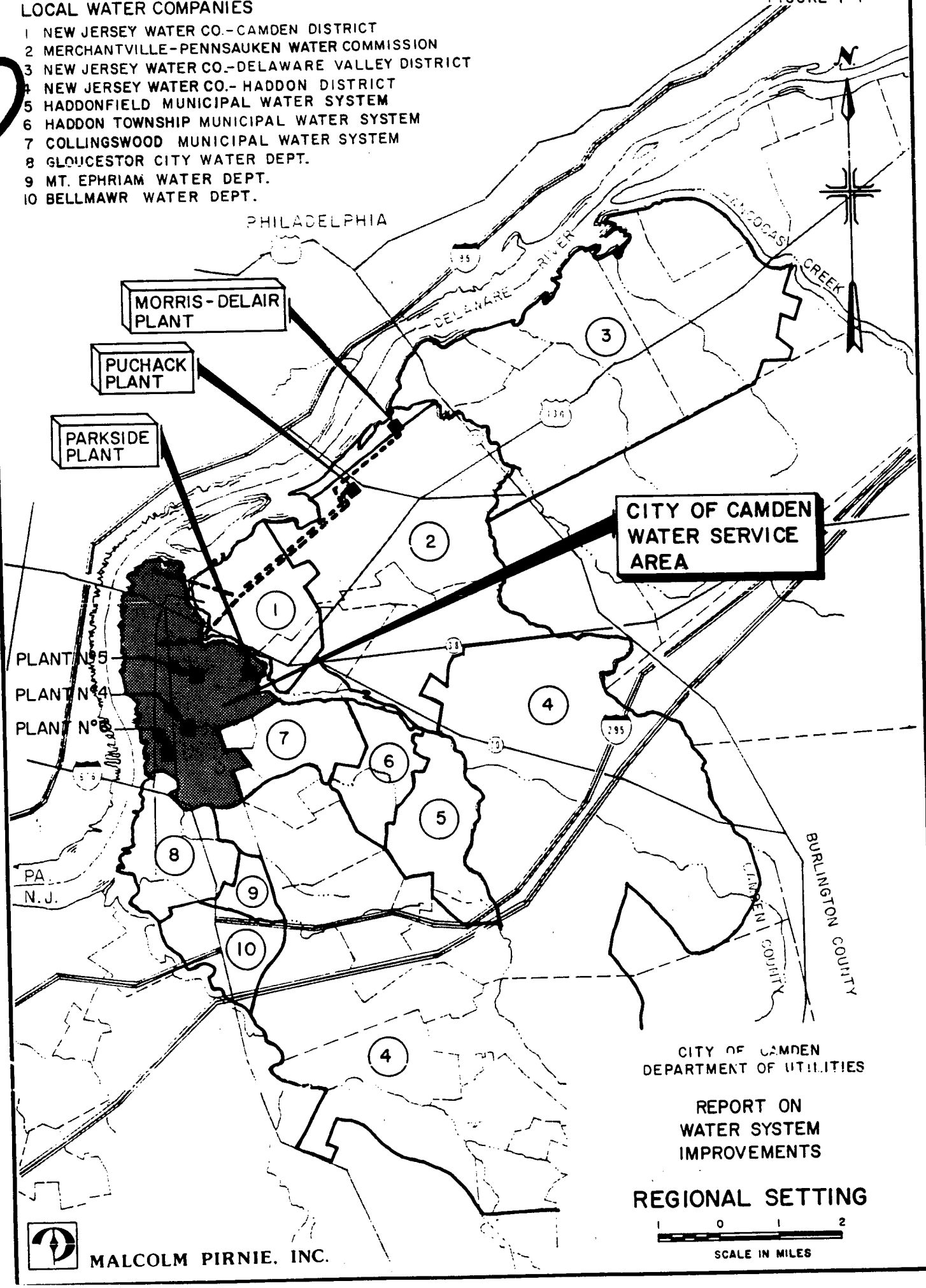

LOCAL WATER COMPANIES
1 NEW JERSEY WATER CO.-CAMDEN DISTRICT
2 MERCHANTVILLE-PENNSAUKEN WATER COMMISSION
3 NEW JERSEY WATER CO.-DELAWARE VALLEY DISTRICT
4 NEW JERSEY WATER CO.- HADDON DISTRICT
5 HADDONFIELD MUNICIPAL WATER SYSTEM
6 HADDON TOWNSHIP MUNICIPAL WATER SYSTEM
7 COLLINGSWOOD MUNICIPAL WATER SYSTEM
8 GLOUCESTOR CITY WATER DEPT.
9 MT. EPHRIAM WATER DEPT.
10 BELLMAWR WATER DEPT.
PHILADELPHIA
DELAWARE RIVER
NEWCOMAS CREEK
MORRIS-DELAIR PLANT
PUCHACK PLANT
PARKSIDE PLANT
CITY OF CAMDEN WATER SERVICE AREA
PLANT N°5
PLANT N°4
PLANT N°6
PA.
N.J.
BURLINGTON COUNTY
CAMDEN COUNTY
N
CITY OF CAMDEN
DEPARTMENT OF UTILITIES
REPORT ON
WATER SYSTEM
IMPROVEMENTS
REGIONAL SETTING
1 0 1 2
SCALE IN MILES
MALCOLM PIRNIE, INC.

TABLE 5-1

APPROXIMATE CAPACITIES AND PUMPAGE FROM EXISTING WELLS

System and Well No.	Year Drilled	Rated Capacity mgd(1)	Estimated Max. Well Capacity mgd(2)	Estimated 1980 Production(3) Pumping Rate, mgd	% Time In Operation	Avg. Pumping Rate, mgd
Morris						
1	1944	1.44	1.7	0.7	<5	0
3	1953	1.44	1.9	1.0	20	0.2
4	1960	2.02	2.5	1.4	20	0.3
6	1932	2.30	1.6	1.6	90	1.4
7	1932	2.30	2.5	1.6	90	1.4
8	1953	1.44	2.5	1.2	40	0.5
10	1960	2.02	2.5	1.3	70	0.9
11	1979	2.45	2.5	2.4	90	2.1
12	1980	2.38	2.5	2.4	0	0
13	1980	2.38	2.5	2.4	0	0
Delair						
1	1930	2.16	2.5	1.4	90	1.3
2	1930	1.87	1.3	0.9	90	0.8
3	1930	1.87	1.1	1.2	90	1.1
Sub-total		26.07	27.6	19.5		10.0
Puchack Run						
1	1924	1.91	2.2	1.4	85	1.2
2	1924	1.93	1.3	0.7	85	0.6
3	1939	2.02	2.5	1.1	85	1.0
5	1930	1.44	2.5	1.2	90	1.1
7	1975	1.86	2.5	1.8	90	1.7
Sub-total		9.16	11.0	6.2		5.6

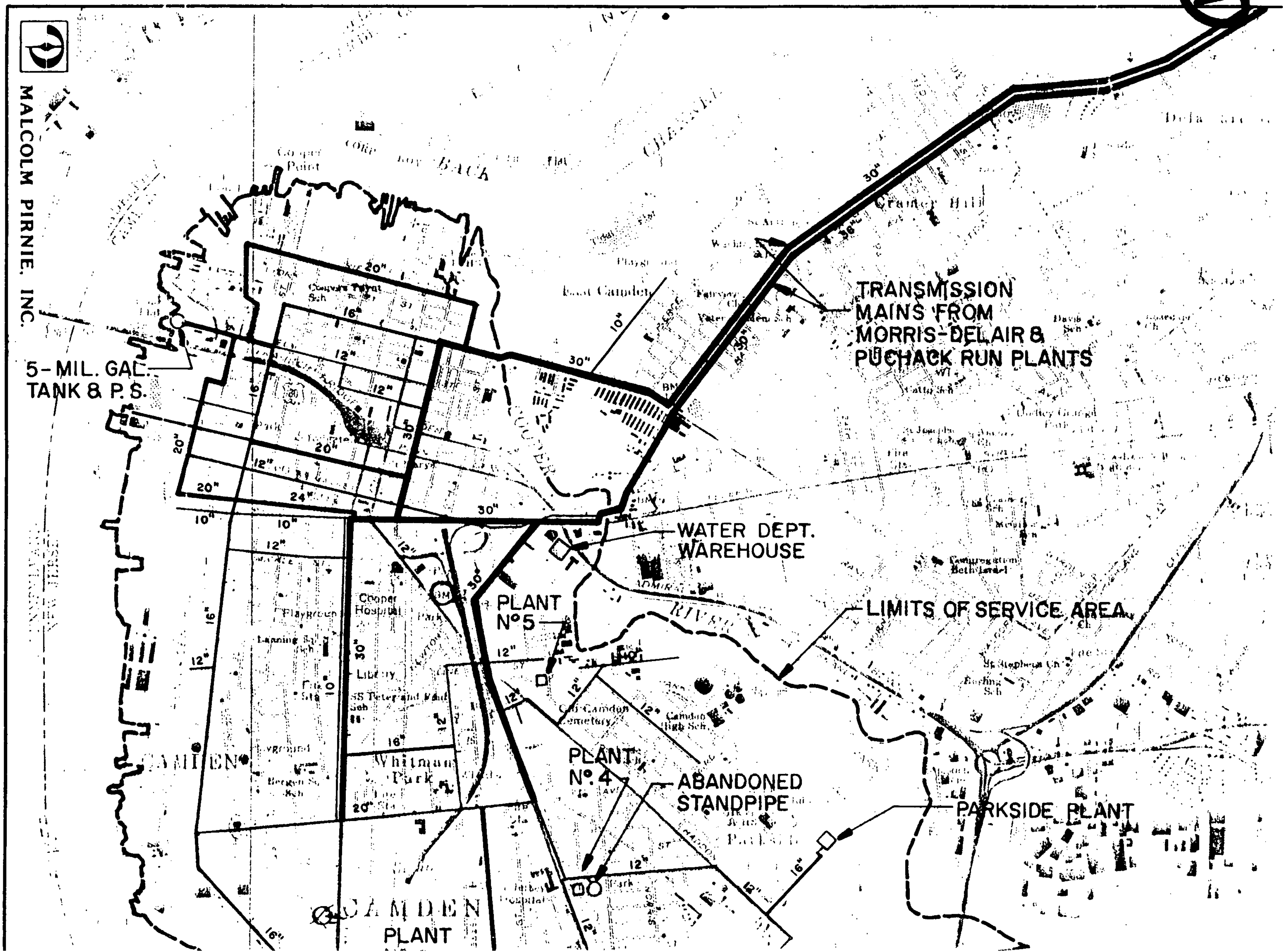
TABLE 5-1 cont'd

APPROXIMATE CAPACITIES AND PUMPAGE FROM EXISTING WELLS

System and Well No.	Year Drilled	Rated Capacity mgd(1)	Estimated Max. Well Capacity mgd(2)	Estimated 1980 Production(3) Pumping Rate, mgd	% Time In Operation	Avg. Pumping Rate, mgd
Parkside						
13	1953	1.44	1.1	1.1	20	0.2
17	1954	1.44	2.3	1.2	90	1.1
18	1976	1.83	2.0	1.7	90	1.6
Sub-total		4.71	5.3	4.0		2.9
Other City Sources						
4	1935	1.01	1.3	1.0	60	0.6
5	1963	1.01	1.7	1.0	60	0.6
7	1966	1.44	2.5	1.4	25	0.4
11	1942	1.44	2.0	1.1	70	0.8
Sub-total		4.90	7.5	4.5		2.4
TOTAL		44.84	51.4	34.2		20.9

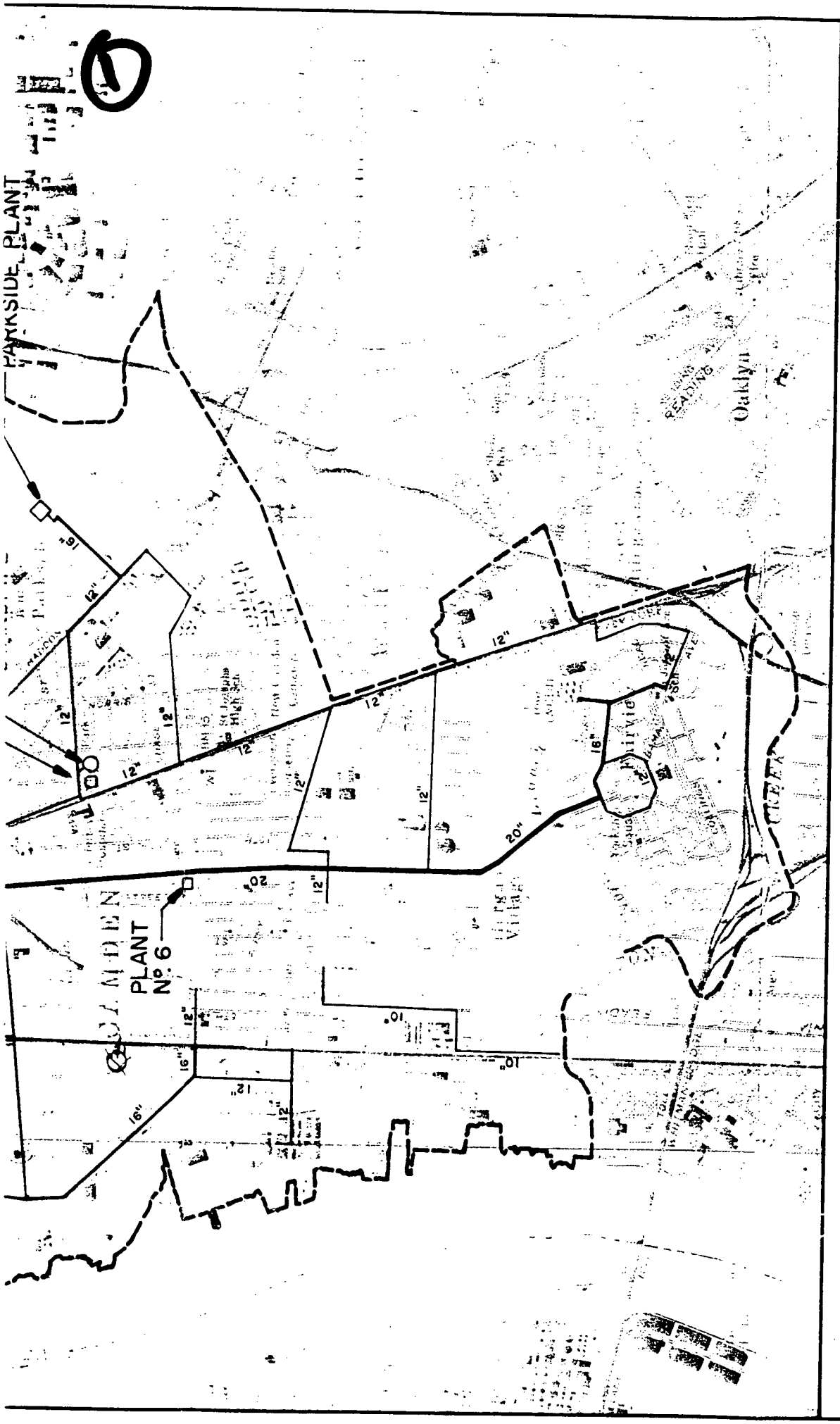
Notes:

1. Original "guaranteed" capacity of well and pump from City records.
2. Theoretical capacity of well assuming no pump limitations and no interference from other wells. Based on well test records and generally-accepted maximum yields per well diameter.
3. Estimated from discussions with City personnel and review of City records.


MALCOLM PIRNIE, INC.
TRANSMISSION MAINS FROM MORRIS-DELAIR & PUCHACK RUN PLANTS
5-MIL. GAL. TANK & P.S.
WATER DEPT. WAREHOUSE
PLANT Nº 5
LIMITS OF SERVICE AREA
PLANT Nº 4
ABANDONED STANDPIPE
PARKSIDE PLANT
PLANT
CAMDEN
30"
20"
16"
12"
24"
10"

3

1 of 3



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SCALE IN FEE

NOTES

1. BASED ON 1975 M
PREPARED BY IN
SERVICES OFFICE
2. MAINS 8-INCHES
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CITY OF CAMD
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REPORT ON
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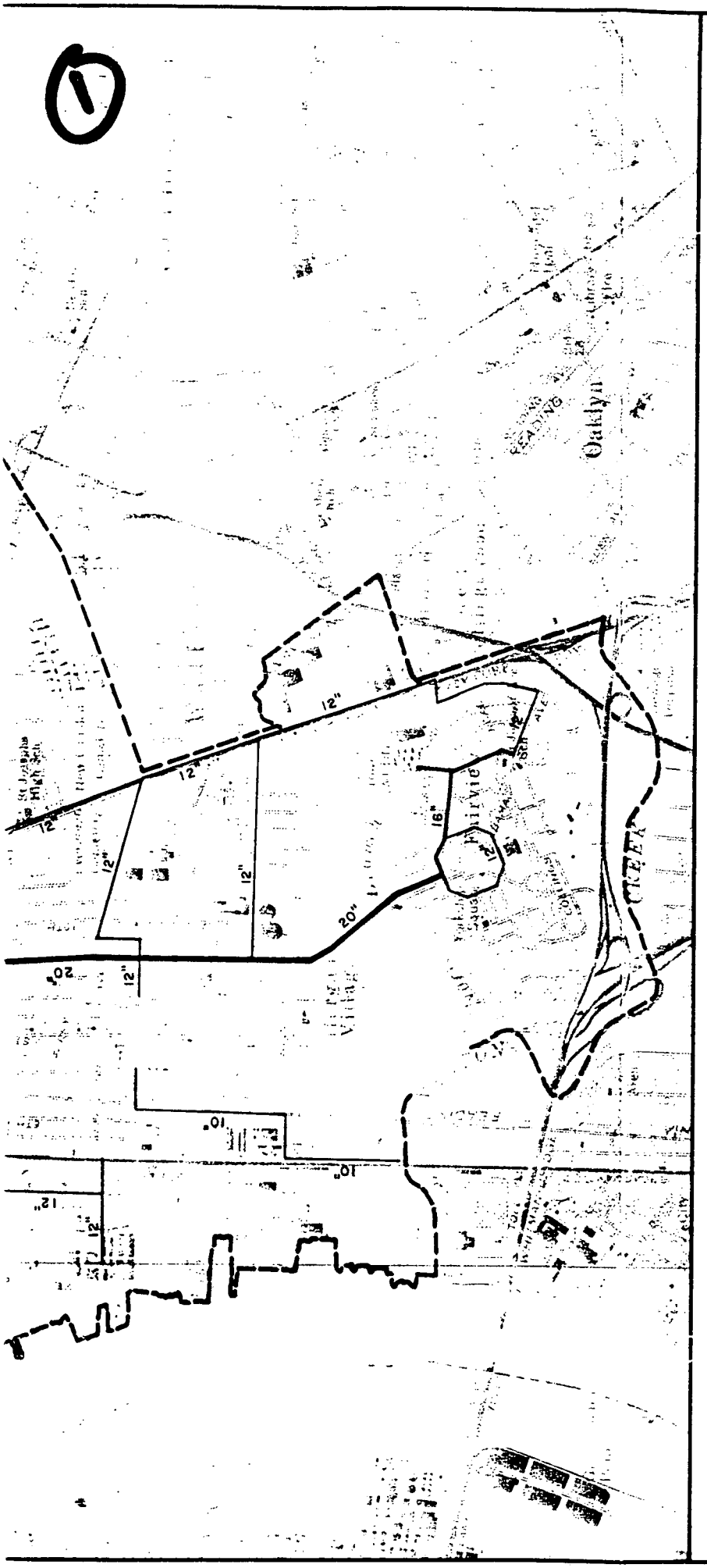
WATER TRANSMI
AND DISTRIBU
SYSTEM

B (2 of 3)

FIGURE 6-1



1000 0 1000 2000 3000

SCALE IN FEET

NOTES

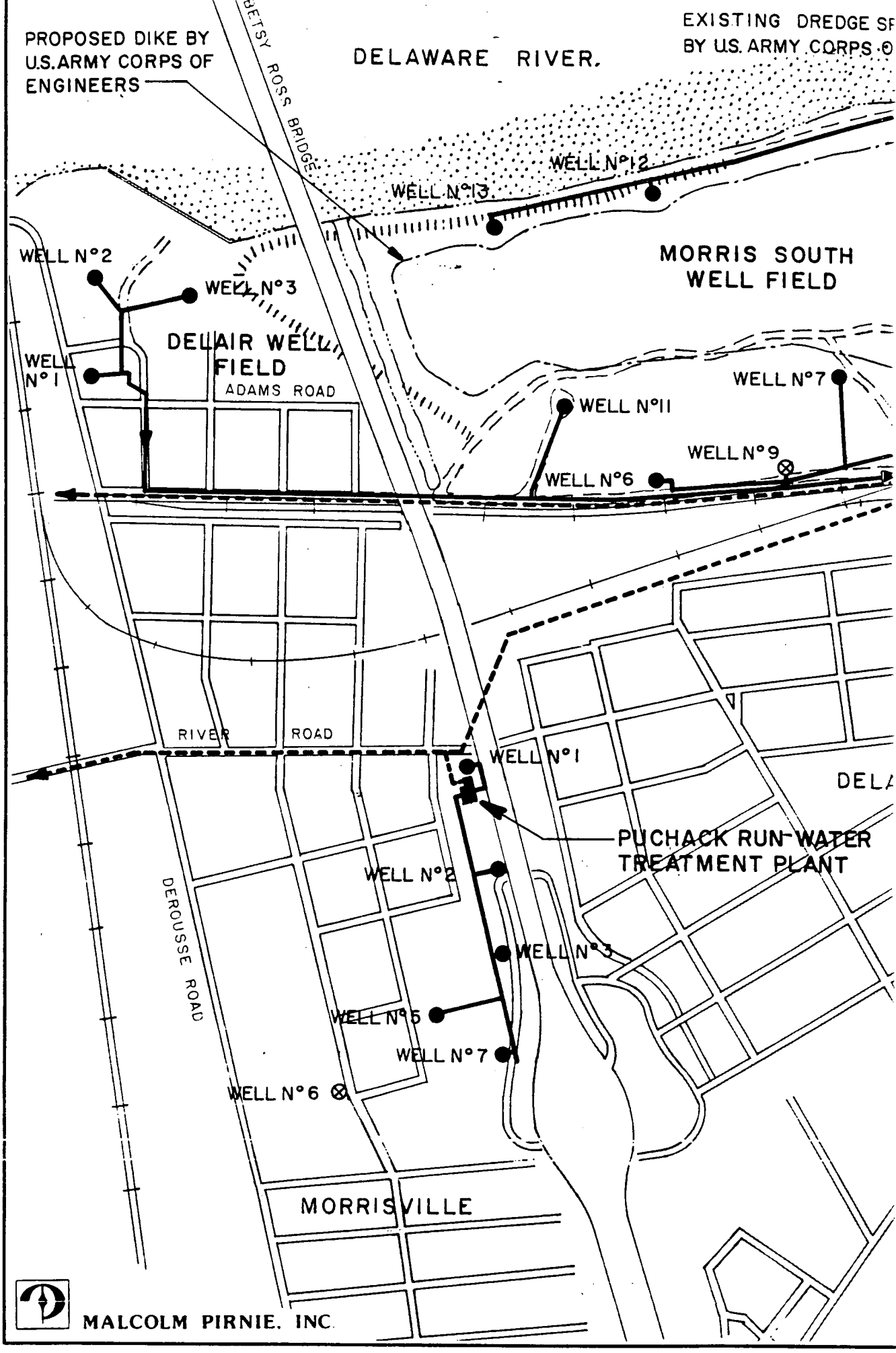
1. BASED ON 1975 MAP OF SYSTEM PREPARED BY INSURANCE SERVICES OFFICE
2. MAINS 8-INCHES IN DIAMETER AND SMALLER ARE NOT SHOWN

CITY OF CAMDEN
DEPARTMENT OF UTILITIES

REPORT ON
WATER SYSTEM
IMPROVEMENTS

SKELETAL PLAN OF WATER TRANSMISSION AND DISTRIBUTION SYSTEM

B 3-3


PROPOSED DIKE BY
U.S.ARMY CORPS OF
ENGINEERS
DELAWARE RIVER.
EXISTING DREDGE SP
BY U.S. ARMY CORPS O
BETSY ROSS BRIDGE
WELL N°12
WELL N°13
MORRIS SOUTH
WELL FIELD
WELL N°2
WELL N°3
DELAIR WELL
FIELD
ADAMS ROAD
WELL
N°1
WELL N°7
WELL N°11
WELL N°9
WELL N°6
RIVER
ROAD
WELL N°1
DELA
PUCHACK RUN WATER
TREATMENT PLANT
WELL N°2
DEROUSSE ROAD
WELL N°3
WELL N°5
WELL N°7
WELL N°6
MORRISVILLE
MALCOLM PIRNIE, INC.

A 1 of 3

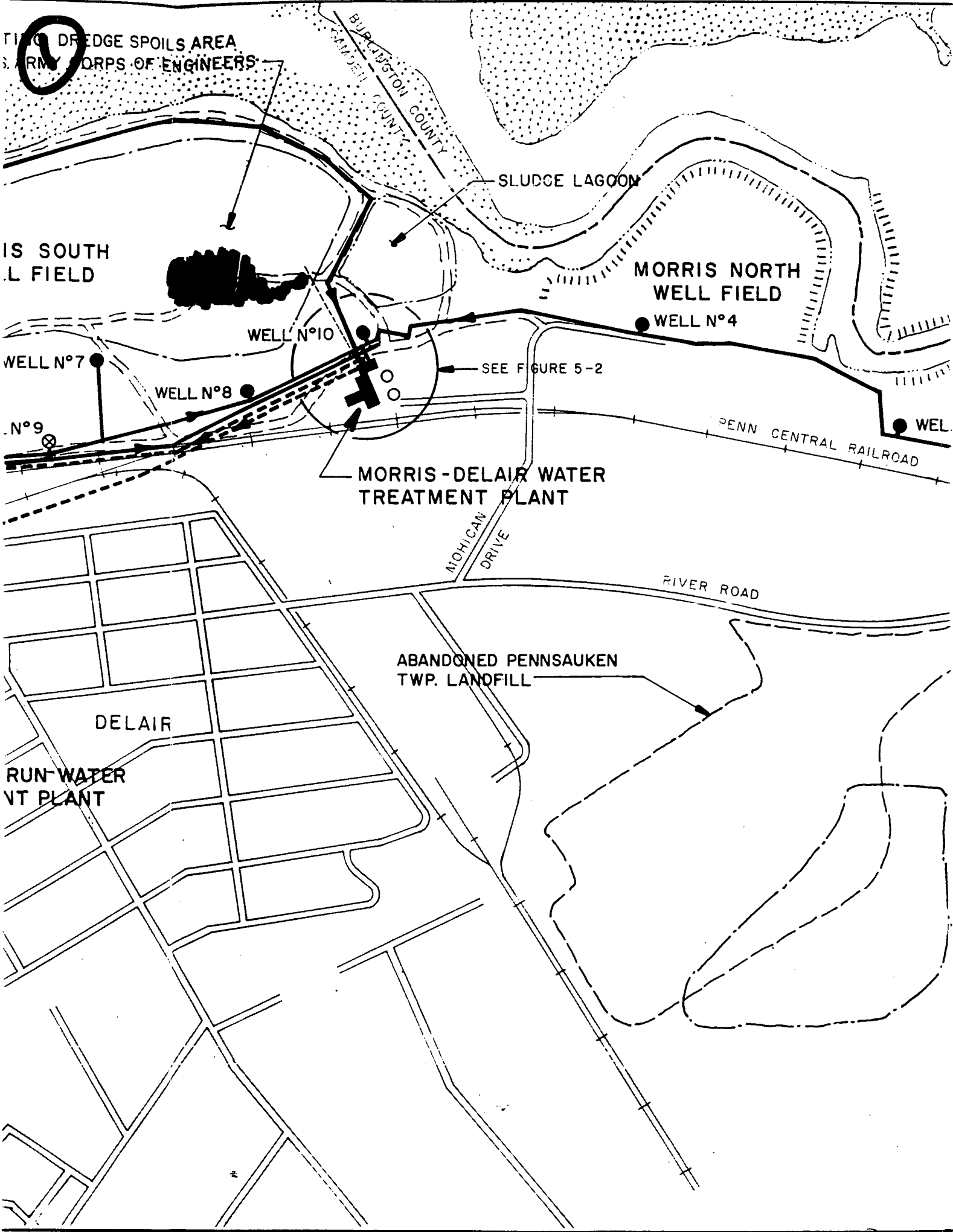
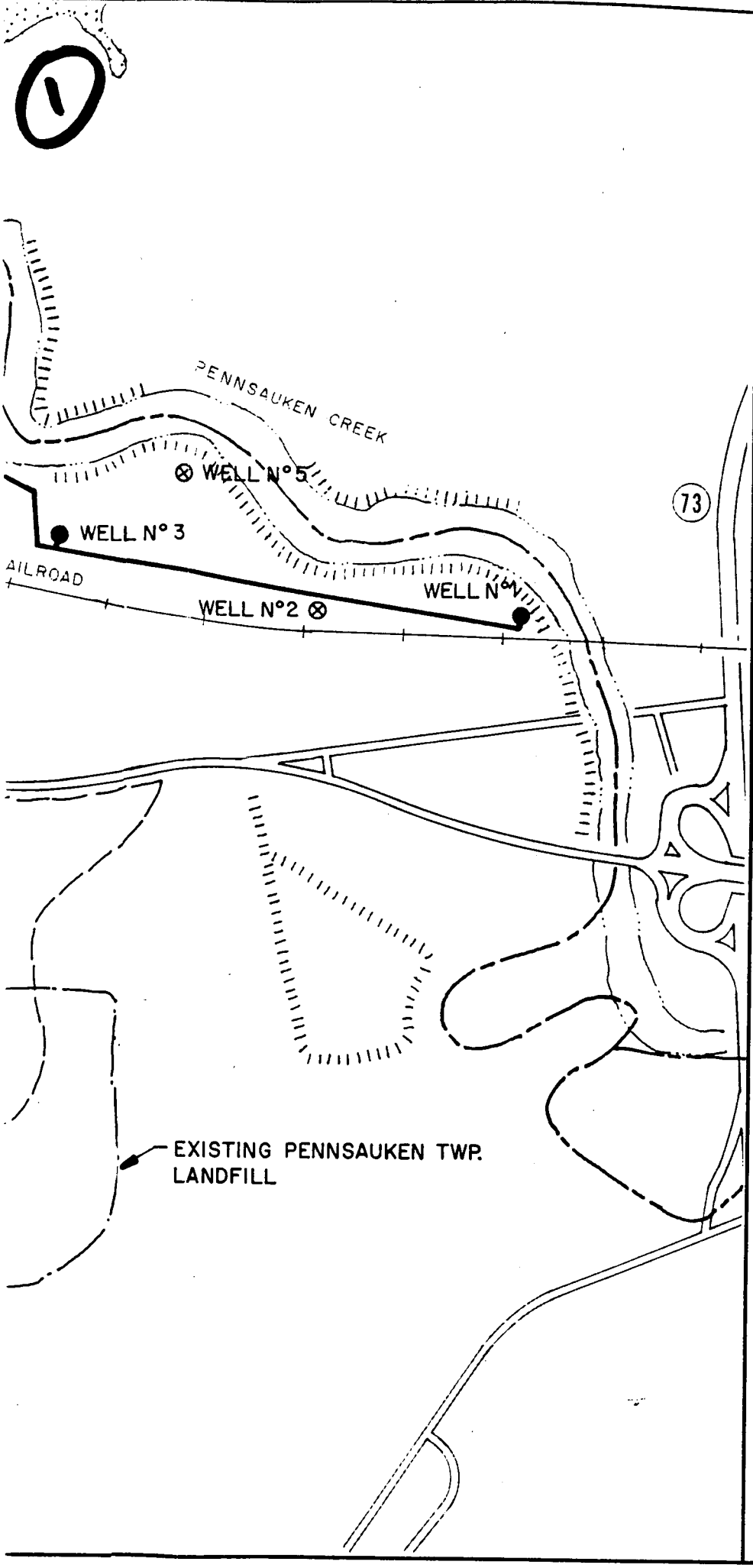
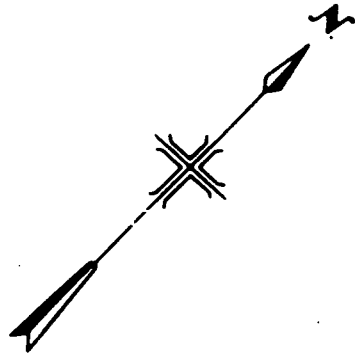

DREDGE SPOILS AREA
ARMY CORPS OF ENGINEERS
BURLINGTON COUNTY
CAMDEN COUNTY
SLUDGE LAGOON
IS SOUTH
L FIELD
MORRIS NORTH
WELL FIELD
WELL N°4
WELL N°10
WELL N°7
WELL N°8
N°9
SEE FIGURE 5-2
PENN CENTRAL RAILROAD
MORRIS-DELAIR WATER
TREATMENT PLANT
MOHICAN
DRIVE
RIVER ROAD
ABANDONED PENNSAUKEN
TWP. LANDFILL
DELAIR
RUN WATER
NT PLANT

FIGURE 5-1





600 300 0 600

SCALE IN FEET

LEGEND

EXISTING FACILITIES

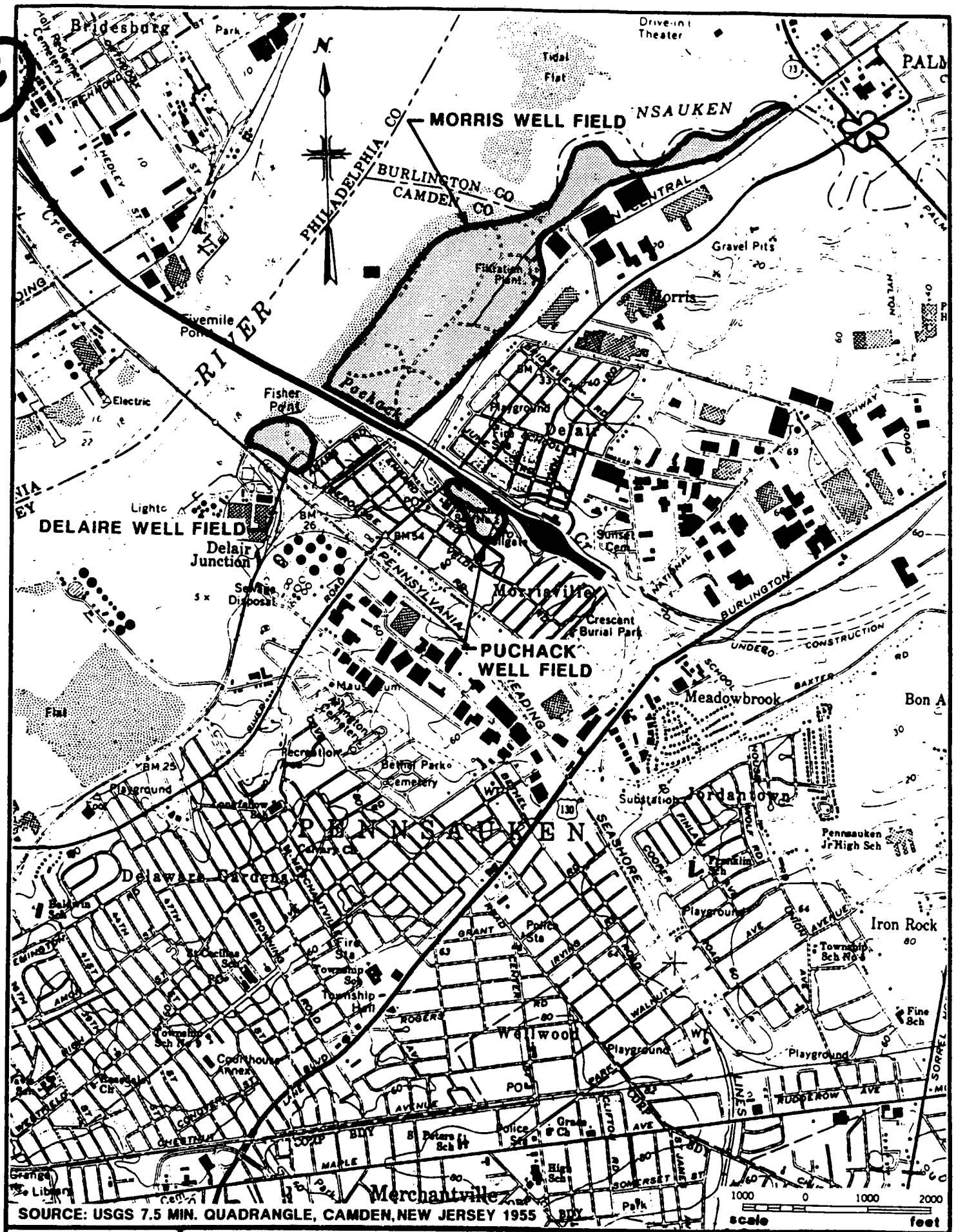
- ● WELL IN USE
- ⊗ ABANDONED WELL
- ——— RAW WATER MAIN
- - - - FINISHED WATER MAIN

CITY OF CAMDEN
DEPARTMENT OF UTILITIES

REPORT ON
WATER SYSTEM
IMPROVEMENTS

GENERAL PLAN
MORRIS-DELAIR AND
PUCHACK RUN SYSTEMS

A (3 of 3)



MALCOLM PIRNIE

CITY OF CAMDEN
WATER SYSTEM IMPROVEMENTS
WELL FIELD LOCATION MAP

MALCOLM PIRNIE, INC.

FIGURE 4-1

148884

TABLE 4-1

DELAIRE WELL FIELD

Owner Well No.	Date Drilled	Present Status S.P.	Total Depth	Well Diameter (in)	Pump Setting C.B.	Pump HP/Stages	Column Pipe Diameter (in)	Bowl Diameter (in)	Well Screen Diameter (in)	Pumping Test Date	Static Water Level From T.O.C (ft)	Average Prod. (gpm)	Pumping Water Level from T.O.C. (ft)	Specific Capacity (gpm/ft)	Comments
1	1930		139'	26	110'2"	100/4	10	12	18	1960 1989	10 35	1680 1133	41 49		Drouse Ave
2	1930	O/S	146'	26	114'4"	75/3	10	12	18	1960 1989	13 25'1"	1330 725	88 93'7"	10.5	pH=6.0
3	1930	O/S	128'6"	26	89'4"	100/3	10	12	18	1960 1989	11'5" 26	1850 739	44'3" 89	10.4	Before 89 Rehab 150gpm pH=6.75

Abbreviations: O/S - out of service
S.P. - Samuel Pine, Well-Field Superintendent
T.O.C - Top of Casing
C.B. - Center Line of Bowl

TABLE 4-2

MORRIS - SOUTHFIELD

Owner Well No.	Date Drilled	Present Status S.P.	Total Depth	Well Diameter (in)	Pump Setting C.B.	Pump HP/Stages	Column Pipe Diameter (in)	Bowl Diameter (in)	Well Screen Diameter (in)	Pumping Test Date	Static Water Level From T.O.C (ft)	Average Prod. (gpm)	Pumping Water Level from T.O.C. (ft)	Specific Capacity (gpm/ft)	Comments
7N	1932	Good	120'	14	89'6"	60/3	8	12	14	1989	30	1278	83	24	
8	1955	Good	124'	18'	94'1"	50/3	10	12		1989	32	600	92	10.7	Debris, High Iron
9N	1932	O/S	143'	18	114'	50/3	10	12		1985 1986 1987	38	775 653 742	119 114 105		Column pipe Dropped 1988
10	1961	Good	19'5	18	94'7"	60/3	10	12		1961 1989	19 36	1529 1272	46 103	18.9	
11	1979	Good	48'10	18	99'11"	100/4	10	12		1979 1989	39 41	2030 1130	85'7" 97	20.1	Reverse rotary, debris pH =6.55
12	1980	Good	124'	18x16	84'9"	75/4	10	12		1980 1989	32 35	2030 1473	70 86'10"	28.8	
13	1981	Good		18x16	84'9"	75/4	10	12		1981 1989	34'7" 35	1515 1543	63 89	28.5	pH=6.84

Abbreviations: O/S - out of service
S.P. - Samuel Pine, Well-Field Superintendent
T.O.C - Top of Casing
C.B. - Center Line of Bowl

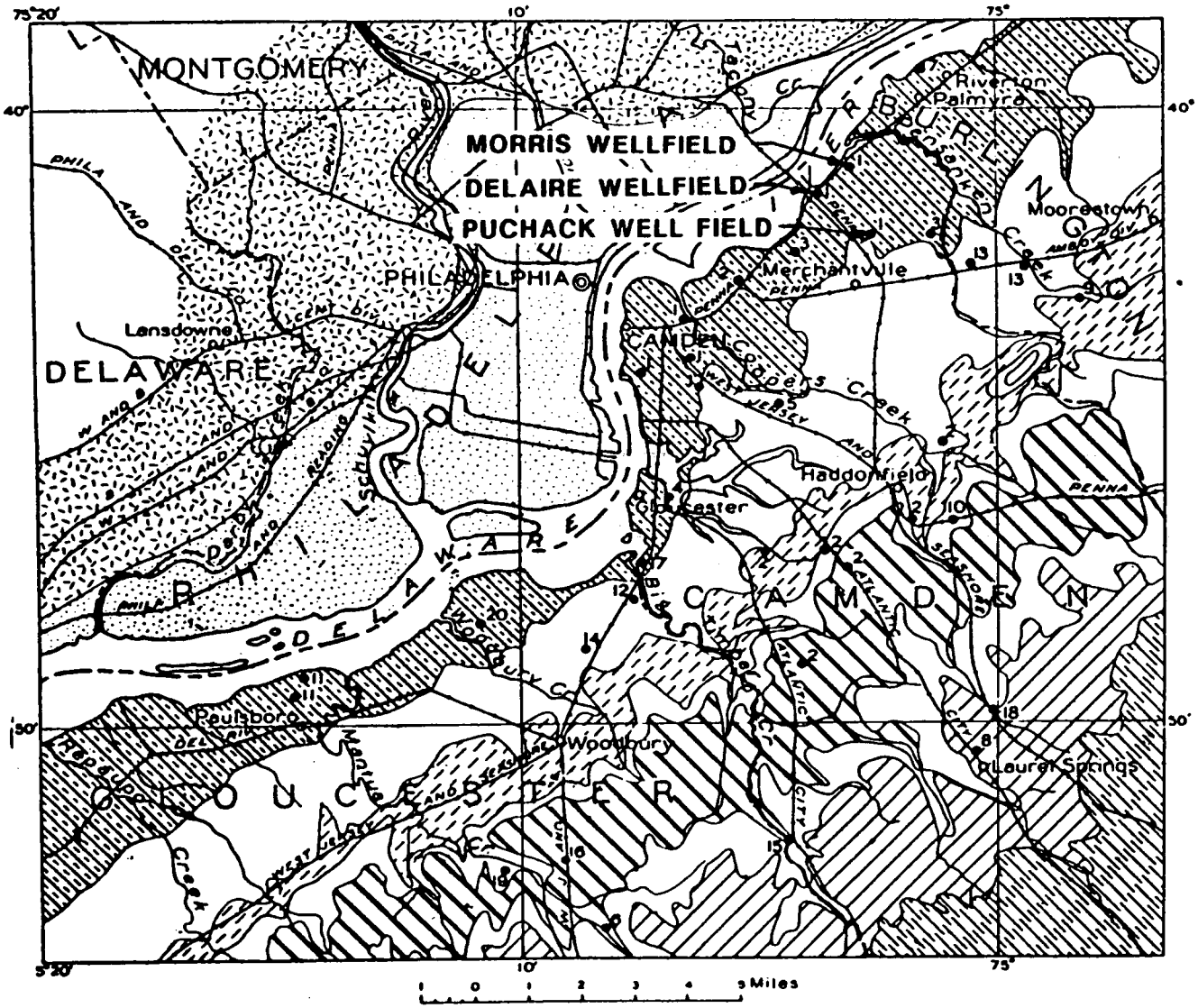
TABLE 4-2 Con't

MORRIS - NORTHFIELD

Owner Well No.	Date Drilled	Present Status S.P.	Total Depth	Well Diameter (in)	Pump Setting C.B.	Pump HP/Stages	Column Pipe Diameter (in)	Bowl Diameter (in)	Well Screen Diameter (in)	Pumping Test Date	Static Water Level From T.O.C (ft)	Average Prod. (gpm)	Pumping Water Level fromTOC (ft)	Specific Capacity (gpm/ft)	Comments
1A	1944	Site Flooded, O/S 5 yrs	121'	18	99'7"	50/3	10	12		1944 1961	10	1125 1110	81		Needs Discharge Pipe & Power
2A	1944	Site Flooded, O/S 10yrs	27'6	18	89'7"	50/3	10	12		1941 1961	12 9'6"	1555 818	87		Motor Miss-ing,building collapsed
3A	1953	Good	103'	18	78'10"	50/2	10	12		1953 1989	12 32	1127 1096	86	20.2	Debris, Junk truck, scat-tered pipes, pH=6.45
4A	1961	Good	34'5	18	99'4"	Trimmed 60/3	10	12		1961 1989	12 24	1585 1641	41 78	30.3	Extensive dumping, pH=6.65
5	Building Demolished - dishcharge pipe broken. Estimate leak at 500 - 700 gpm. +/- 6 Acres underwater														
6N	1932	O/S Good	33'6	18	103'9"	50/2	8	12		1932 1989	33	1550 500	65 102		Pumping gravel,1987-new screen No improv.

Abbreviations: O/S - out of service
S.P. - Samuel Pine, Well-Field Superintendent
T.O.C - Top of Casing
C.B. - Center Line of Bowl

134649



EXPLANATION

Quaternary alluvium probably underlain in part by Magothy and Raritan formations	QUATERNARY
Cohansey Sand	TERTIARY
Kirkwood Sand	TERTIARY
Mount Laurel and Wenonah sands	CRETACIOUS
Englishtown sand	CRETACIOUS
Magothy and Raritan formations	CRETACIOUS
Crystalline rocks which contain little water	ALGONKIAN

SOURCE: BULLETIN 39 N.J. DEPT. OF CONSERVATION AND DEVELOPMENT 1932

MALCOLM PIRNIE

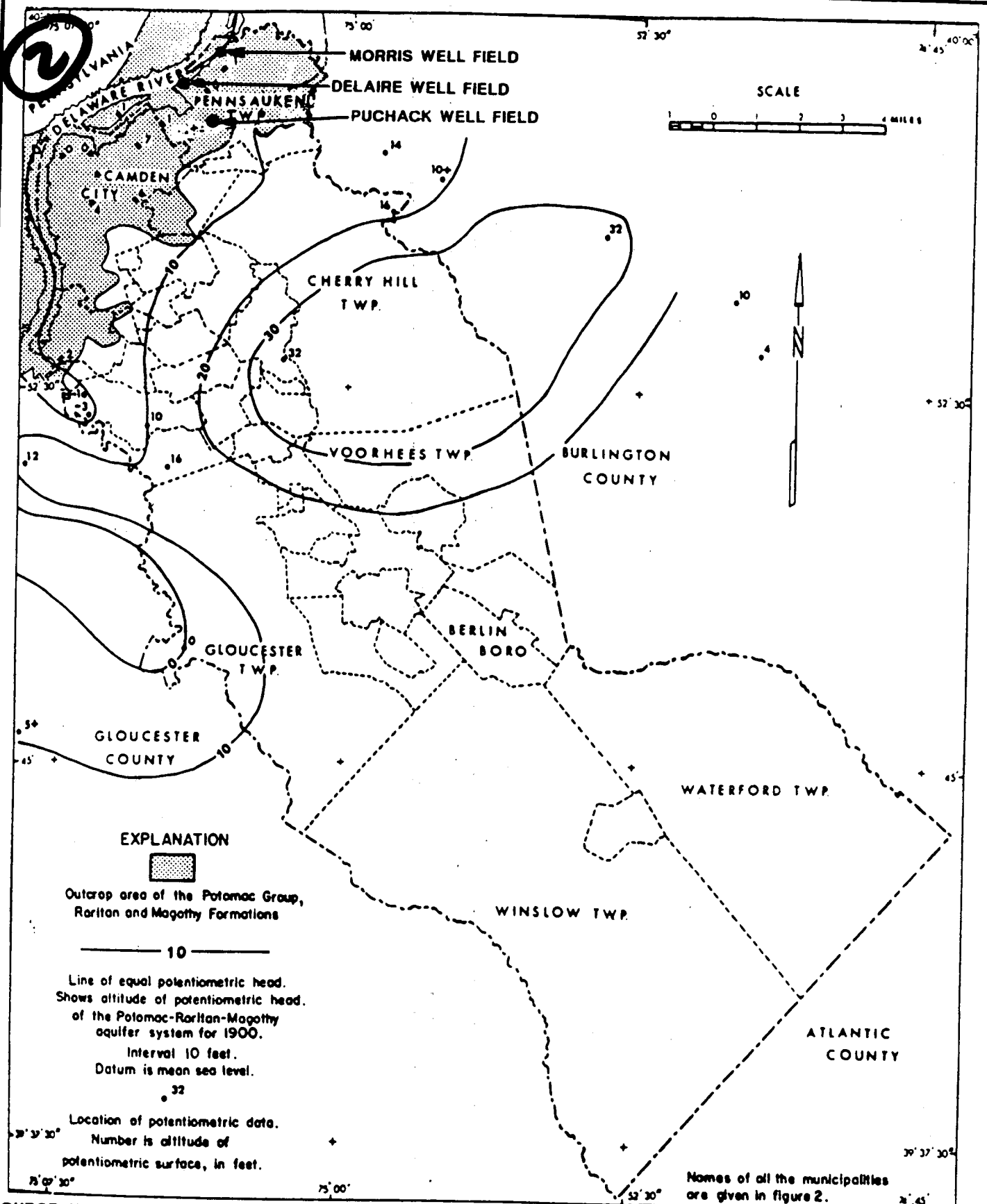
CITY OF CAMDEN

WATER SYSTEM IMPROVEMENTS

MAP OF CAMDEN AREA SHOWING PRINCIPAL WATER-BEARING FORMATIONS AND LOCATION OF SOURCES OF PUBLIC WATER SUPPLIES

MALCOLM PIRNIE, INC.

FIGURE 4-2



SOURCE: U.S.G.S. PUBLICATION 76-76
GEOLOGY AND GROUND-WATER
RESOURCES OF CAMDEN COUNTY
NEW JERSEY
1976

MALCOLM PIRNIE

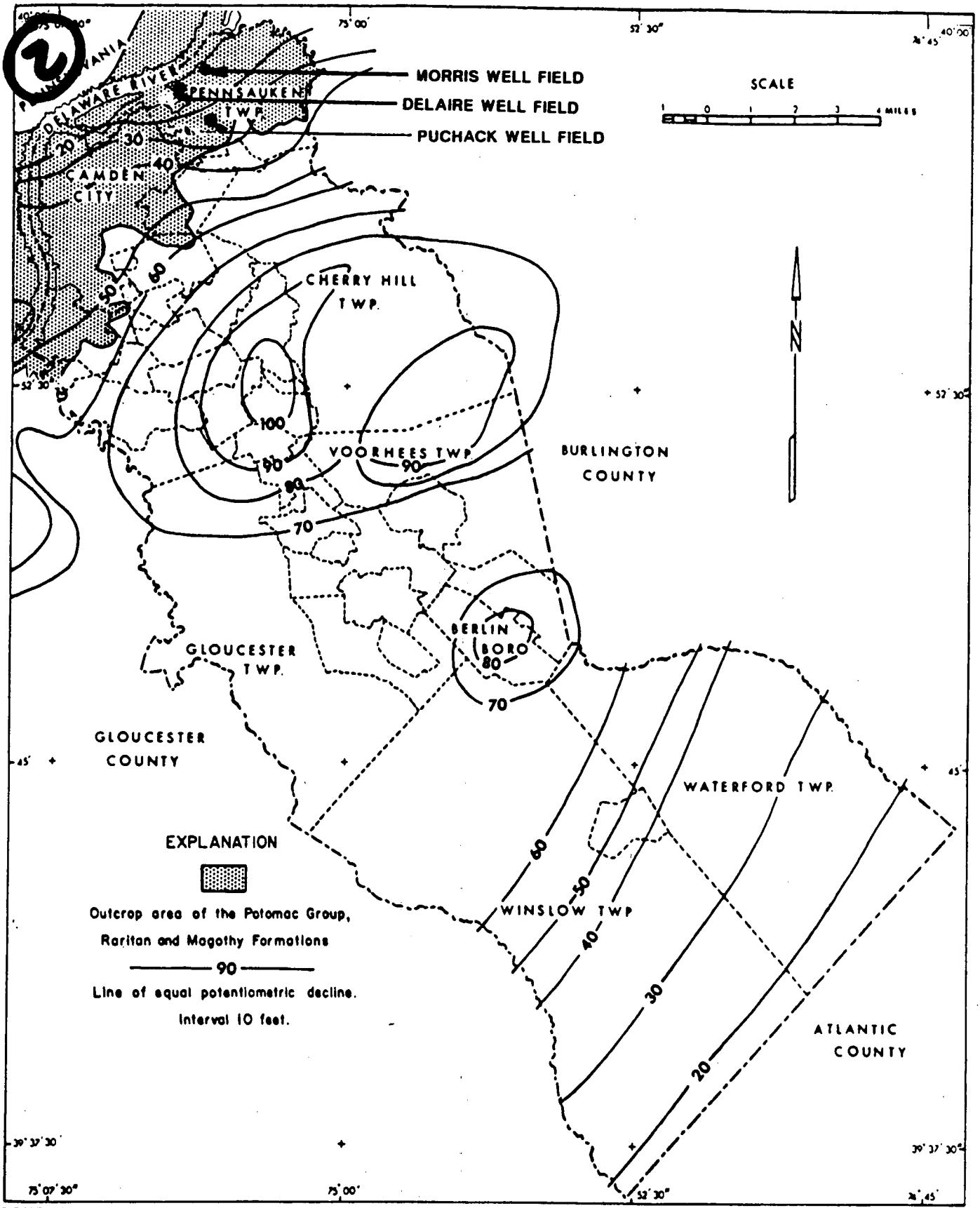
CITY OF CAMDEN
WATER SYSTEM IMPROVEMENTS

POTENTIOMETRIC MAP FOR THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM IN CAMDEN COUNTY, 1900

MALCOLM PIRNIE, INC.

FIGURE 4-3

148884



SOURCE: U.S.G.S. PUBLICATION 76-76
GEOLOGY AND GROUND-WATER
RESOURCES OF CAMDEN COUNTY,
NEW JERSEY
1976

MALCOLM PIRNIE

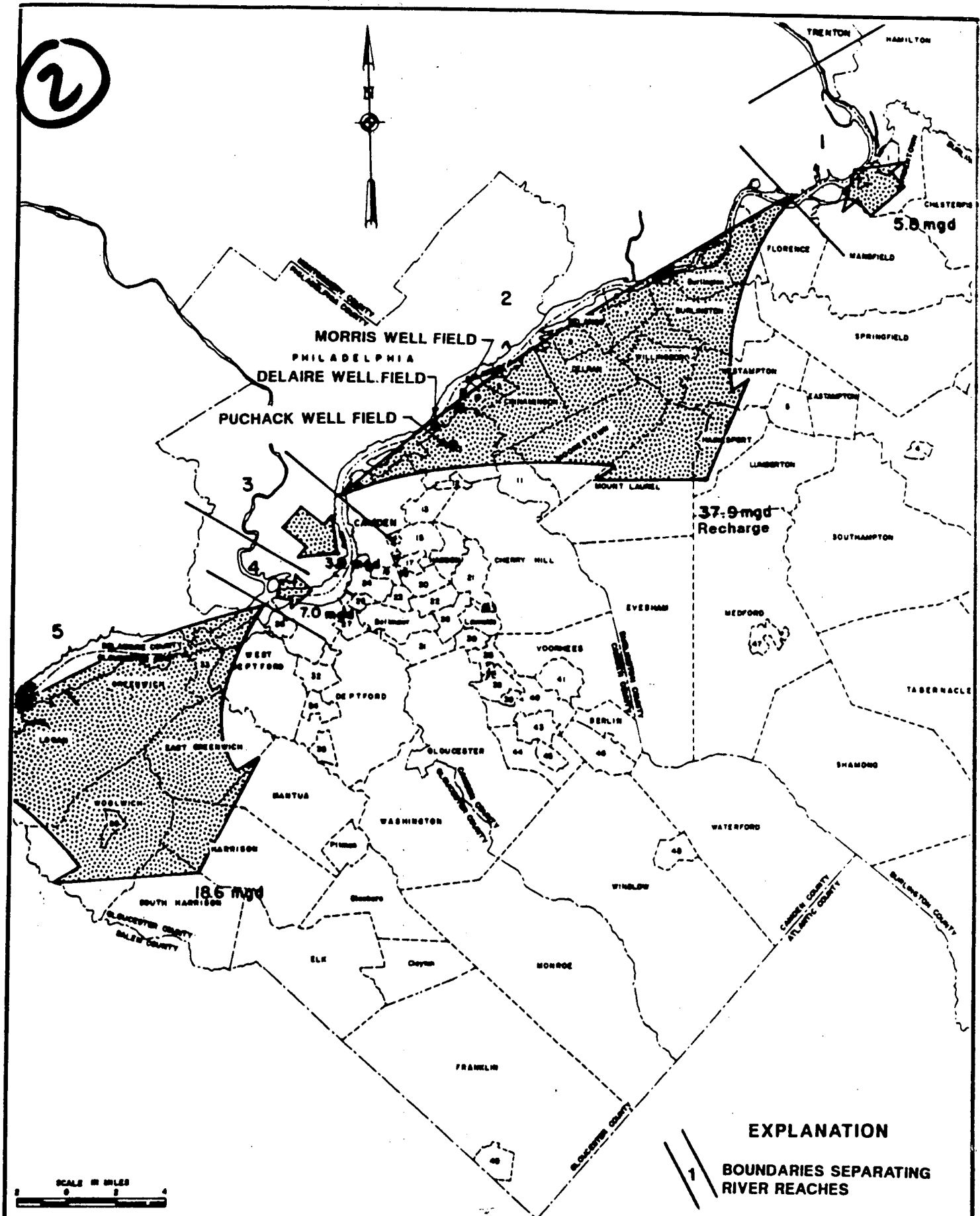
CITY OF CAMDEN
WATER SYSTEM IMPROVEMENTS

POTENTIOMETRIC DECLINE MAP FOR THE POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM IN CAMDEN COUNTY, 1900-68

MALCOLM PIRNIE, INC.

FIGURE 4-4

146884



SOURCE: U..S. ARNY CORPS OF ENGINEERS, CAMDEN, METROPOLITAN URBAN STUDY APPENDICES 1-2, VOLUME II APRIL 1980

MALCOLM PIRNIE

CITY OF CAMDEN
WATER SYSTEM IMPROVEMENTS
MAP SHOWING RECHARGE TO AND FROM THE DELAWARE RIVER

MALCOLM PIRNIE, INC.

FIGURE 4-5

148084

TABLE 5-3

Morris Delair Finished Water Quality
Monthly Averages

Date	Treated Flow (mgd)	pH	Alk (mg/L)	Hardness (mg/L)	Pre Cl2 (lbs)	Post Cl2 (lbs)	Lime (lbs)	PO4 (lbs)	Free Cl2 Resid (mg/L)	Iron (mg/L)	Mn (mg/L)
1/89	13.00	6.93	---	---	200.00	200.00	6194.13	100.00	0.17	0.10	---
2/89	12.54	9.05	---	---	---	400.00	6300.00	100.00	0.18	0.18	0.05
3/89	13.19	9.05	76.00	156.00	---	400.00	6785.00	40.00	0.16	0.20	0.07
4/89	15.27	8.80	---	---	---	400.00	4605.00	96.00	0.22	0.38	0.11
5/89	15.93	9.01	---	---	---	400.00	3214.00	100.00	0.24	0.38	0.12
6/89	17.91	9.34	---	---	---	405.00	4660.00	100.00	0.30	0.34	0.07
7/89	16.73	9.35	92.00	89.10	---	500.00	4360.00	100.00	0.39	0.27	0.06
8/89	16.83	9.32	---	---	---	500.00	3889.00	100.00	0.42	0.25	0.07
9/89	15.05	8.85	---	---	---	500.00	3403.00	100.00	0.39	0.30	0.11
10/89	16.01	9.35	---	---	---	500.00	3366.00	100.00	0.35	0.29	0.06
11/89	14.57	9.45	---	---	---	427.00	3393.00	73.00	0.33	0.29	0.06
12/89	14.13	9.40	54.00	71.00	---	350.00	3488.00	97.80	0.33	0.28	0.10
1/90	15.40	9.39	---	---	---	343.00	4187.00	52.00	0.33	0.25	0.06
2/90	1.95	9.47	---	---	---	423.00	6187.00	50.00	0.31	0.23	0.06

(3)

TABLE 2-2

WELL CONSTRUCTION AND PERFORMANCE DATA

Component	Well No. 13	Well No. 17	Well No. 18
Year Drilled	1954	1954	1978
Depth (feet)	230	257	288
Pump Setting Depth (feet)	173	183	180
Casing Dimension (in x in)	10x14	16x18	18[1]
Yield Original (gpm)	963	1001	1300
Current Pumping Level	158	188	122

Notes:

1- Diameter of the well = 18 inches

TABLE 2-1

WELL INSPECTION DATA

Component	Well No. 13	Well No. 17	Well No. 18
Pump	Layne	Layne	Layne
Motor	U.S.Motor	U.S.Motor	U.S.Motor
H.P.	75	75	75
RPM	1800	1800	1800
Pressure Valve	Yes	Yes	Yes
Check Valve	Yes	Yes	Yes
Flow Meter	Yes	Yes	Yes
Pressure Sensor	No	No	No
Water Level Indicator	Yes	Yes	Yes
Low Water Cut	No	No	No
Well House	Good	Good	Good
Heater	Yes	Yes	Yes
Emergency Power Supply	No	No	No

Additional Comments:

- Flow meters for each well are located in the filter plant.
- New heaters were recently placed at the well houses.
- Emergency power supply is available but is not connected to the system.
- Pumps can be either operated manually at the wells or remotely from the plant.

TABLE 2-1
PROJECTED AVERAGE DAY WATER DEMANDS
(mgd)

Year	Domestic	Domestic Equivalent	10-hour Industrial	24-hour Industrial	Other Demands	Total
1990	3.4	1.6	2.5	1.7	4.7	13.9
1992	3.7	1.6	3.0	1.8	4.9	15.0
1994	3.9	1.6	3.2	1.9	5.0	15.6
1995	4.3	1.6	3.3	1.9	5.1	16.2
2000	5.0	1.9	3.9	2.2	5.4	18.4
2005	5.9	2.2	4.5	2.6	5.7	20.9
2010	6.9	2.6	5.3	3.1	6.0	23.9

Notes:
(1) Projections do not include usage by NJ American Water.
(2) Domestic Equivalent includes institutions (schools, hospitals, etc.)
(3) 10-hour Industrial includes industrial sites having 10-hr work days as well as small businesses and office complexes.
(4) 24-hour Industrial includes industrial sites that operate 24 hours a day.
(5) Other demands include leakage and unmetered flow. Unmetered flow includes fireflow, main flushing, swimming pools, water testing, construction sites, sewer cleaning, street cleaning, general landscaping, etc...
(6) 1990 average day water demands are based on actual usage as measured in the field.

074C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: September 4, 1992 Time: 11:00 AM [] PM []

Outgoing Call

To: J.P. Duganzic, P.E. (609)-547-1700 Telephone No.

Affiliation: N.J. American Water Company

Malcolm Pirnie Staff: Lisa Szegedi (609) 860-0100 Telephone No.

Summary of Conversation:

Mr. Duganzic verified the locatins of the wells which are located on the SI 4- mile radius map. The locations are the following:

1) 6 wells are located near the 7th Ave. and Rt. 295 in Haddon Heights
2) 2 wells are located near Walnut Ave. in Magnolia
3) 3 wells are located near 7th Ave. and Chews Landing Road in Runnemede
4) 2 wells are located near Park Ave. in Mt. Ephraim
5) 2 wells are located near the intersection of Clements Bridge Road and Black Horse Tpke. in Runnemede. (Note: On the SI map one well is located on the east side of Black Horse Tpke. and one well is located on the west side of Black Horse Tpke. Both wells are located to the east of Black Horse Tpke.)

Altogether, this system contains 45 wells which serve approximately 215,000 people. The water from all of the wells is blended before distribution. Not all wells are in use at all times. Depending upon the demand, wells are turned on and off throughout the year. All of the wells tap the P-R-M aquifer, with approximately 1/2 the wells tapping the lower P-R-M, 1/3 of the wells utilizing the middle P-R-M, and 1/6 of the wells screening the upper P-R-M. Mr. Duganzic confirmed the presence of a continuous layer of clay approximately 100 feet thick in the vicinity of the site all the way south to Atlantic City.

C01-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
FLAGS RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 6 AUGUST 1992 Time: 1054 [✓] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: MICKEY HARTMAN 609-931-1546
Telephone No.
Affiliation: WATER ACCOUNTS, MOUNT EPHRAIM WATER DEPT.

Malcolm Pirnie Staff: RICKEY KAMPFER
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

- MS HARTMAN STATED THAT APPROXIMATELY 4,500 PERSONS IN THE MOUNT EPHRAIM TWP. ARE BEING SUPPLIED WITH POTABLE DRINKING WATER.

- MOUNT EPHRAIM RECIEVES ALL OF ITS WATER FROM THE NEW JERSEY AMERICAN WATER CO., AND DOES NOT HAVE ANY OF ITS OWN TWP. WELLS.

f:\rectele.jan(1)

D10-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-080

Date: 7 Aug 92 Time: 9:13 [✓] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: JIM YOUNG 547-3327
Telephone No.
Affiliation: SUPERINTENDANT, HADDON HEIGHTS PUBLIC WORKS

Malcolm Pirnie Staff: RICKEY KAMPFER
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MR YOUNG INFORMED ME THAT HADDON HEIGHTS RECIEVES ALL OF ITS PUBLIC POTABLE WATER SUPPLIES FROM THE NEW JERSEY AMERICAN WATER CO, AND DOES NOT MAINTAIN OR OPERATE ANY OF ITS OWN WELLS

f:\rectele.jan(1)

011-C

ARCS II CONTRACT 68-W9-0051
MALCOLM PIRNIE, INC.
RECORD OF TELEPHONE CONVERSATION/AGREEMENT

File No. 8003-08-0

Date: 7 Aug 92 Time: 931 [ ] AM [ ] PM

[ ] Incoming Call From: _____
Telephone No.
Affiliation: _____

[✓] Outgoing Call To: DIANA CRUZ 609-428-5914
Telephone No.
Affiliation: CLERK, VORHEES ENGINEERING DEPT.

Malcolm Pirnie Staff: RICKEY KAMPFER 609-860-0100
(Receiving or Calling) Name Telephone No.

Summary of [✓] Conversation [ ] Agreement:

MS CRUZ STATED THAT ALL PUBLIC SUPPLY POTABLE WATERS ARE SUPPLIED BY NEW JERSEY AMERICAN WATER CO AND THE TOWN OF VORHEES DOES NOT MAINTAIN OR OPERATE ANY WELLS.

f:\rectele.jan(1)

MALCOLM PIRNIE, INC.	PROJECT NOTES

To: File	**Date:** April 1, 1993
From: Lisa Szegedi	**Project #:** 8003-080
Subject: Waste Source	**Site Name:** Flags, Inc.

One waste source has been identified at the Flags, Inc. site. Based on soil sampling results, an area of 26,000 square feet of soil contaminated with organic and inorganic contaminants has been identified.

HRS DOCUMENTATION RECORD
Flags Incorporated - 09/19/92

1. Site Name: Flags Incorporated
   (as entered in CERCLIS)

2. Site CERCLIS Number: NJD 002352300

3. Site Reviewer: Lisa Szegedi/Steven T. McNulty

4. Date: 9/9/92

5. Site Location: Bellmawr/Camden, New Jersey
   (City/County,State)

6. Congressional District: NJ-01

7. Site Coordinates: Single

   Latitude: 39 52'09.0" Longitude: 075 04'55.0"

	Score
Ground Water Migration Pathway Score (Sgw)	19.88
Surface Water Migration Pathway Score (Ssw)	0.21
Soil Exposure Pathway Score (Ss)	12.86
Air Migration Pathway Score (Sa)	0.48

Site Score	11.84

NOTE

EPA uses the terms "facility," "site," and "release" interchangeably. The term "facility" is broadly defined in CERCLA to include any area where hazardous substances have "come to be located" (CERCLA Section 109(9)), and the listing process is not intended to define or reflect boundaries of such facilities or releases. Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

GROUND WATER MIGRATION PATHWAY SCORESHEET
Flags Incorporated - 09/19/92

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer Aquifer: Lower Aquifer PMR Sy		
1. Observed Release	550	0
2. Potential to Release		
2a. Containment	10	10
2b. Net Precipitation	10	6
2c. Depth to Aquifer	5	1
2d. Travel Time	35	5
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	120
3. Likelihood of Release	550	120
Waste Characteristics		
4. Toxicity/Mobility	*	1.00E+02
5. Hazardous Waste Quantity	*	10
6. Waste Characteristics	100	6
Targets		
7. Nearest Well	50	9.00E+00
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	2.27E+03
8d. Population (lines 8a+8b+8c)	**	2.27E+03
9. Resources	5	0.00E+00
10. Wellhead Protection Area	20	0.00E+00
11. Targets (lines 7+8d+9+10)	**	2.28E+03
12. Targets (including overlaying aquifers)	**	2.28E+03
13. Aquifer Score	100	19.88
GROUND WATER MIGRATION PATHWAY SCORE (Sgw)	100	19.88

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
Flags Incorporated - 09/19/92

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	1
2c. Distance to Surface Water	25	9
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	100
3. Potential to Release by Flood		
3a. Containment (Flood)	10	10
3b. Flood Frequency	50	7
3c. Potential to Release by Flood (lines 3a x 3b)	500	70
4. Potential to Release (lines 2d+3c)	500	170
5. Likelihood of Release	550	170
Waste Characteristics		
6. Toxicity/Persistence	*	1.00E+04
7. Hazardous Waste Quantity	*	10
8. Waste Characteristics	100	18
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.00E+00
13. DRINKING WATER THREAT SCORE	100	0.19

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
Flags Incorporated - 09/19/92

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	170
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+08
16. Hazardous Waste Quantity	*	10
17. Waste Characteristics	1000	180
Targets		
18. Food Chain Individual	50	0.00E+00
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations	**	0.00E+00
19c. Pot. Human Food Chain Contamination	**	3.00E-07
19d. Population (lines 19a+19b+19c)	**	3.00E-07
20. Targets (lines 18+19d)	**	3.00E-07
21. HUMAN FOOD CHAIN THREAT SCORE	100	0.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
Flags Incorporated - 09/19/92

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	170
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc.	*	5.00E+06
24. Hazardous Waste Quantity	*	10
25. Waste Characteristics	1000	56
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0.00E+00
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	2.54E-01
26d. Sensitive Environments (lines 26a+26b+26c)	**	2.54E-01
27. Targets (line 26d)	**	2.54E-01
28. ENVIRONMENTAL THREAT SCORE	60	0.03
29. WATERSHED SCORE	100	0.21
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	0.21

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SOIL EXPOSURE PATHWAY SCORESHEET
Flags Incorporated - 09/19/92

SOIL EXPOSURE PATHWAY Factor Categories & Factors RESIDENT POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
1. Likelihood of Exposure	550	550
Waste Characteristics		
2. Toxicity	*	1.00E+04
3. Hazardous Waste Quantity	*	10
4. Waste Characteristics	100	18
Targets		
5. Resident Individual	50	4.50E+01
6. Resident Population		
6a. Level I Concentrations	**	0.00E+00
6b. Level II Concentrations	**	5.70E+01
6c. Resident Population (lines 6a+6b)	**	5.70E+01
7. Workers	15	5.00E+00
8. Resources	5	0.00E+00
9. Terrestrial Sensitive Environments	***	0.00E+00
10. Targets (lines 5+6c+7+8+9)	**	1.07E+02
11. RESIDENT POPULATION THREAT SCORE	**	1.06E+06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

SOIL EXPOSURE PATHWAY SCORESHEET
Flags Incorporated - 09/19/92

SOIL EXPOSURE PATHWAY Factor Categories & Factors NEARBY POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
12. Attractiveness/Accessibility	100	1.00E+01
13. Area of Contamination	100	2.00E+01
14. Likelihood of Exposure	500	5.00E+00
Waste Characteristics		
15. Toxicity	*	1.00E+04
16. Hazardous Waste Quantity	*	10
17. Waste Characteristics	100	18
Targets		
18. Nearby Individual	1	0.00E+00
19. Population Within 1 Mile	**	1.60E+01
20. Targets (lines 18+19)	**	1.60E+01
21. NEARBY POPULATION THREAT SCORE	**	1.44E+03
SOIL EXPOSURE PATHWAY SCORE (Ss)	100	12.86

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

AIR PATHWAY SCORESHEET
Flags Incorporated - 09/19/92

AIR MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release		
2a. Gas Potential to Release	500	0
2b. Particulate Potential to Release	500	280
2c. Potential to Release	500	280
3. Likelihood of Release	550	280
Waste Characteristics		
4. Toxicity/Mobility	*	8.00E-01
5. Hazardous Waste Quantity	*	10
6. Waste Characteristics	100	1
Targets		
7. Nearest Individual	50	2.00E+01
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	1.22E+02
8d. Population (lines 8a+8b+8c)	**	1.22E+02
9. Resources	5	0.00E+00
10. Sensitive Environments		
10a. Actual Contamination	***	0.00E+00
10b. Potential Contamination	***	1.35E-01
10c. Sens. Environments(lines 10a+10b)	***	1.35E-01
11. Targets (lines 7+8d+9+10c)	**	1.42E+02
AIR MIGRATION PATHWAY SCORE (Sa)	100	4.82E-01

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

1. WASTESTREAM QUANTITY SUMMARY TABLE, SOURCE: Contaminated Soil

a. Wastestream ID	
b. Hazardous Constituent Quantity (C) (lbs.)	0.00
c. Data Complete?	NO
d. Hazardous Wastestream Quantity (W) (lbs.)	0.00
e. Data Complete?	NO
f. Wastestream Quantity Value (W/5,000)	0.00E+00

2. SOURCE HAZARDOUS WASTE QUANTITY FACTOR TABLE

a. Source ID	Contaminated Soil
b. Source Type	Contaminated Soil
c. Secondary Source Type	N.A.
d. Source Volume (yd3) | Source Area (ft2)	0.00 | 26000.00
e. Source Volume/Area Value	7.65E-01
f. Source Hazardous Constituent Quantity (HCQ) Value (sum of 1b)	0.00E+00
g. Data Complete?	NO
h. Source Hazardous Wastestream Quantity (WSQ) Value (sum of 1f)	0.00E+00
i. Data Complete?	NO
k. Source Hazardous Waste Quantity (HWQ) Value (2e, 2f, or 2h)	7.65E-01

Source Hazardous Substances	Depth (feet)	Liquid	Concent.	Units
Barium	< 2	NO	6.7E+01	ppm
Chromium	< 2	NO	2.8E+01	ppm
Copper	< 2	NO	6.9E+02	ppm
Lead	< 2	NO	1.1E+01	ppm
Manganese	< 2	NO	2.0E+02	ppm
Nickel	< 2	NO	3.4E+01	ppm
Silver	< 2	NO	1.9E+02	ppm
Zinc	< 2	NO	2.1E+02	ppm